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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,279	02/14/2001	Yves Michel Henuset	10503-US	8368

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EXAMINER

LEADER, WILLIAM T

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 06/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/782,279	Applicant(s) HENUSET ET AL.	
	Examiner William T. Leader	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 3-6 and 12-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Sale (6,342,150).

3. The Sale patent is directed to a process is directed to a system for the reduction-oxidation of water. As shown in figure 1, the system includes a cylindrical treatment vessel having an internal chamber, an inlet 16 and an outlet 18. A plurality of planar, porous electrodes are disposed in the vessel in an orientation generally perpendicular to the direction of flow through the vessel so that the water being treated passes through the pores of the electrodes. The electrodes are connected to power supply 36 so that the polarity of successive electrodes alternates, one electrode being connected as an anode, the next electrode being connected as a cathode. The anode is

made of a material with activity such that in operation the contaminants are oxidized (column 3, lines 10-17). Thus, the Sale patent discloses all elements of the apparatus recited in instant claim 1.

4. Instant claim 3 recites that the porous anode comprises a substrate having an anodic coating, while instant claim 4 recites that the substrate is tantalum or titanium and instant claim 5 recites that the anodic coating may be platinum. Sale discloses that the anodes may be made of platinized titanium, meeting the limitations of claims 3-5. See column 2, lines 14-6.

5. Instant claim 6 recites that the at least one cathode is porous and sized so that wastewater passes through the pores of the cathode. As noted above, Sale teaches the cathodes as well as the anodes are porous and oriented in a manner so that the water to be treated passes through the pores of the electrodes. See figure 1.

6. Instant claim 12 recites that the target substance to be oxidized by the reactor comprises an aryl compound, while claims 13 and 14 recite specific aryl compounds. The limitations of claims 12-14 relate to the intended use of the reactor, rather than being limitations directed to the structure of the reactor itself. "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666,667 (Bd. App. 1969). See MPEP section 2115 "Material or Article Worked Upon by Apparatus."

The limitations of claims 12-14 are not considered to distinguish the structure of the claimed apparatus from that of Sale.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 2, 7, 8, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sale et al (6,342,150) in view of Zappi et al (6,328,875).

10. Sale et al is taken as above. Instant claims 2 and 7 recite that the porous anode and porous cathode comprise a foam. Sale et al disclose the use of porous electrodes which have a large surface area so as to promote oxidation and reduction. The electrode may be made of a wool, fabric, felt or the like (column 4, line 66 to column 5, line 3). While Sale does disclose the use of three-dimensional materials in fabricating the electrodes, a foam is not specifically taught. The Zappi et al patent is directed to electrolytic apparatus for the purification of aqueous solutions such as wastewater from industrial manufacturing. As shown in figure 8, the apparatus includes an electrolysis cell with porous electrodes of alternating polarity. Anodes may be made of platinized titanium and be of a high surface area configuration such as felts or foams (column 11, lines 32-37).

11. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have utilized electrodes in the form of a foam rather than a felt in the process of Sale because Zappi et al teach that felts and foams are alternative choices for the configuration of electrodes in an electrolysis cell for purification of water.

12. Instant claim 8 differs from Sale by reciting that the cathode comprises nickel. Zappi et al disclose that nickel is a suitable cathode material (column 11, lines 59-61). It would have been obvious at the time the invention was

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made to have made the cathodes of Sale to comprise nickel because Zappi et al teach that nickel is useful as a cathode material.

13. Instant claim 10 recites that the reactor comprises from two to ten anodes and from three to eleven cathodes, while claim 11 recites that the reactor comprises seven cathodes and six anodes. Sale teaches that the system may have a single pair of electrodes, or multiple pairs of electrodes, depending upon the treatment requirements (column 5, line 67 to column 6, line 2). The electrodes may have any number of geometries including square and circular (column 10, lines 29-33). Zappi et al disclose that the electrode stack may be formed several alternating anodes spacers and cathodes (column 10, lines 21-28). Figure 8 shows an arrangement including electrodes in the arrangement of cathode-anode-cathode-anode-cathode. The three cathodes and two anodes fall within the ranges recited in instant claim 10. It would have been obvious to have utilized the number of electrodes recited in claims 10 and 11 in the apparatus of Sale because Zappi et al specifically show that an arrangement with three cathodes and two anodes, as recited in claim 10, is useful, and both patents teach that a plurality of electrode pairs may be used, suggesting a larger number of electrodes as recited in claim 11. In view of the teaching of Zappi et al and the teaching of Sale that the number of electrodes depends upon the treatment

requirements, one of ordinary skill in the art would be able to choose an appropriate number of electrodes.

14. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sale et al (6,342,150) in view of Zappi et al (6,328,875) as applied to claims 2, 7, 8 and 10 above, and further in view of Haas (4,339,324) and Herbst et al (5,611,907).

15. Instant claim 9 recites that the body is tubular and the internal chamber is generally cylindrical. As noted above, figure 1 of Sales depicts a tubular electrochemical reactor with a generally cylindrical internal chamber. Claim 9 differs from Sale by reciting that each anode and cathode is supported by an insulating holder sized to be slidably inserted into the chamber. The Haas patent is directed to an electrolytic cell with a plurality of parallel electrode plates. Each electrode assembly 62 includes a plate electrode 64 surrounded by a nylon electrode frame 63. See column 6, lines 27-33 and figure 6. The Herbst et al patent is directed to a device for the electrolytic treatment of liquid waste streams. The device includes a plurality of electrode plates 232 mounted within housing 220. See figure 2. Herbst et al teach that the electrode plates are preferably slidably removable from the housing to facilitate fast and efficient repair or replacement (column 3, lines 24-27). It would have been obvious at the time the invention was

made to have placed the electrodes of Sale in an insulating frame because Haas teaches that this is a useful method for mounting electrodes in an electrolysis chamber. It would additionally been obvious to have sized the frames to be slidably removable because this would have facilitated efficient repair or replacement as taught by Herbst et al.

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Kim et al patent (4,445,990) is directed to an electrolytic reactor for cleaning wastewater. The reactor includes porous electrodes through which the water flows.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 703-308-2530. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

WL

William Leader
May 28, 2003

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700